IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	: **10/807,173**	Confirmation No. 4125
Applicant	: HASHIMOTO, A. et al.	
Filed	: March 24, 2004	
Title	: COMPUTER SYSTEM, CONTROL APPARATUS, STORAGE SYSTEM AND COMPUTER DEVICE	
TC/AU	: 2186	
Examiner	: TBD	
Docket No.	: G&P-105	
Customer No.:	24956	

PETITION TO MAKE SPECIAL
UNDER 37 CFR §1.102(d) (MPEP §708.02(VIII))

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Applicants petition the Commissioner to make the above-identified application special in accordance with 37 CFR §1.102(d). In support of this Petition, pursuant to MPEP § 708.02(VIII), Applicants state the following.

(A) REQUIRED FEE

This Petition is accompanied by the fee set forth in 37 CFR § 1.117(h). A Credit Card Payment Form in the amount of $130 accompanies this Petition in satisfaction of the fee. The Commissioner is hereby authorized to charge any

additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) ALL CLAIMS ARE DIRECTED TO A SINGLE INVENTION

Following the Amendment filed on an even date herewith, claims 1-13 have been canceled and claims 14-44 have been added. Accordingly, claims 14-44 are pending in the application. All the pending claims of the application are directed to a single invention. If the Office determines that all claims in the application are not directed to a single invention, Applicant will make election without traverse as a prerequisite to the grant of special status.

The claimed invention, as set forth in independent claims 14, 27, 31, 36, and 41, is generally directed to logical partitioning technology. Under independent claim 14, the invention is a computer system comprising: a computer having a first resource; a storage system having a second resource; a first information for managing said first resource; a second information for managing said second resource; a third information for managing a relation between a virtual computer realized on said computer and a virtual storage system realized on said storage system; wherein said computer has a first function to partition said first resource logically and to make each partition of said first resource run as an independent said virtual computer; and wherein said storage system has a second function to partition said second resource logically and to make each partition of said second resource run as an independent said virtual storage system.

Additionally, as set forth under independent claim 27, the invention is a computer system comprising: a computer; a storage system; and a first information group; said computer comprising: a first processor which executes an information transaction, a first memory storing information used for controlling of said first processor or information sent from an external device, a first resource group including said first processor and said first memory, and plural virtual computers generated by partitioning each resource in said first resource group logically; said storage system comprising: plural disk devices storing data sent from said computer, a second processor which controls transmitting data to said plural disk devices, a second memory storing information used for controlling said second processor or data sent from said computer, a second group resource including said second processor and said second memory, and plural virtual storage systems generated by partitioning each resource in said second group resource logically; said first information group having: information related between a first virtual computer in said plural virtual computers and a first virtual storage system in said plural virtual storage systems.

Also, as set forth in independent claim 31, the invention is a computer connected to a storage system, said computer comprising: a first resource; a first information for managing said first resource; a second information for managing a second resource said storage system has: a third information for managing a relation between a virtual computer realized on said computer and a virtual storage system realized on said storage system, and a function to partition said first resource

logically and to make each of partitioned said first resource run as an independent said virtual computer.

Furthermore, as set forth in independent claim 36, the invention is storage system connected to a computer, said storage system comprising: a second resource; a second information for managing said second resource; and a function to partition said second resource logically and to make each partition of said second resource run as an independent virtual storage system.

Finally, as set forth in independent claim 41, the invention is a management terminal connected to a computer and a storage system, comprising: a first information for managing a first resource of said computer; a second information for managing a second resource of said storage system; and a third information for managing a relation between a virtual computer realized on said computer and a virtual storage system realized on said storage system, wherein said management terminal sends said first information to said computer to cause said computer to partition said first resource logically and to cause each partition of said first resource run as an independent said virtual computer.

(C) PRE-EXAMINATION SEARCH

A careful and thorough pre-examination search has been conducted, directed to the invention as claimed. The pre-examination search was conducted in the following **US Manual of Classification** areas:

Class	Subclass
711	114, 170, 173, 202

Furthermore, a keyword search was conducted on the USPTO's EAST database, including the published patent applications database, and the European and Japanese abstract databases. In addition, a search for foreign patent documents was conducted on the European Patent Office's ESPACENET database.

Additionally, a search has been performed by an examiner in the British Patent Office on the British equivalent of the present application. The results of this search are also listed below.

(D) DOCUMENTS DEVELOPED BY THE PRE-EXAMINATION SEARCH

The documents located by the pre-examination search and additional documents located through the Applicants' internal search efforts are listed below. These documents were made of record in the present application by the Information Disclosure Statement filed February 24, 2005.

Document No.	Inventor
US 5568629	Gentry, Timothy W.
US 5829053	Smith, David Lee et al.
US 20030055933	Ishizaki, Takeshi et al.
US 20030084241	Lubbers, Clark E. et al.
US 20030115434	Mahalingam, Mallik et al.
US 20030182501	George, Elizabeth et al.
US 20040049564	Ng, Chan et al.
US 20040111596	Rawson, III, Freeman
US 20050010722	Chen, Chih-Wei
US 20050015546	Zohar, Ofir et al.

Additionally, the following documents were located by a search performed by an examiner in the British Patent Office and cited in a Combined Search and

Examination Report dated September 29, 2004. These documents were made of record in the present application by the Information Disclosure Statement filed April 14, 2005.

Document No.	Inventor
US 20020016812	Uchishiba, Michihro et al.
US 20020124040	Foster, Robert K. et al.
US 20030097393	Kawamoto et al.

Additionally, the following document was made of record in the present application by the Information Disclosure Statement filed June 15, 2004.

Document No.	Inventor
JP 2003157177	Kawamoto et al.

Because all of the above-listed documents are already of record in the present application, in accordance with MPEP § 708.02(VIII)(D), additional copies of these documents have not been submitted with this Petition.

(E) DETAILED DISCUSSION OF THE REFERENCES

Those of the above-listed documents deemed to be most closely-related to the present matter encompassed by the claims are discussed first below, pointing out, with the particularity required by 37 CFR 1.111 (b) and (c), how the claimed present matter is patentable over the teachings of these documents.

1. Discussion of the Invention

Under the invention, a computer device has a first control block that logically partitions computing resources of the computer device and makes resulting partitions run as independent virtual computers. A storage system has a second control block that logically partitions storage resources of the storage system and makes resulting partitions run as independent virtual storage systems. The system further includes a management unit having: a first control table that controls computing resources of the computer device; a second control table that controls storage resources of the storage system; and a third control table that controls the relations between the virtual computers and the virtual storage systems, and which tables may also be referred to as "informations". The first control block logically partitions the computing resources according to settings in the first information; the second control block logically partitions the storage resources according to settings in the second information; and the third information may be used to control the allocation of storage resources. Thus, since storage resources can be logically partitioned and controlled in a way to match logical partitioning of server resources, system resources including server and storage resources can be optimally allocated.

Accordingly, it is submitted that the present invention is patentable over the cited references, since the claims of the present application provide for an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as set forth in independent claims 14, 31, and 41.

Further, a feature of the invention includes an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27.

An additional feature of the invention is that a storage system includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36.

As will be discussed in more detail below, the prior art does not teach or suggest the above-described features which are useful for controlling the allocation of resources of virtual computers and virtual storages.

2. Discussion of the References Deemed to be Most-Closely Related

The published US patent application to Ishizaki, US 20030055933, shows a means for selectably interconnecting between at least one logical partition of at least one server and at least one volume in a storage unit, so that information received from one or more sources is directed to a particular one of a plurality of virtual routers. Ishizaki includes a service configuration table 400 that contains configuration information of the system, a virtual private network (VPN) table 500 for use in virtual service management of the system, and a server table 1600 for containing information such as physical server, logical partition ID and HBA ID. Also included are a service status table 900 that correlates faults with customers and a storage table 1700 that contains information regarding HBAs allowed to access a

particular storage volume. (See, e.g., Abstract, figures 1-20, and paragraphs 7-15, 65, and 79-83.) However, none of the tables of Ishizaki are used for managing the relations between a virtual computer and a virtual storage. Rather, for example, the VPN table 500 is used for defining the mapping between a service customer and resources in each system for configuring a VPN router. Also, the service mapping table 800 defines the mapping between service customers and resources in each subsystem. Thus, none of the tables of Ishizaki include an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, none of the tables of Ishizaki include an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Rather the tables of Ishizaki are all applied to managing the relations between service customers and system resources. Additionally, Ishizaki does not disclose or suggest a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Ishizaki.

The published US patent application to Rawson, US 20040111596, shows a logically-partitioned data processing system. A hypervisor creates partitions and allocate physical resources to the partitions. The physical resources may include

disks provided through a storage area network (SAN), and the SAN may be partitioned in the same manner as the main data processing system. (See, e.g., Abstract and paragraphs 10 and 35.) Thus, Rawson provides for logical partitioning of a processing system and a storage area, but provides no means for checking the condition of the virtual storage resources. Thus, Rawson provides no table or other information for managing the relations between a virtual computer and a virtual storage. Rather, under Rawson, the hypervisor sends partition information to the SAN, and the SAN creates a corresponding "shadow" SAN partition. Accordingly, Rawson does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Rawson does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Rawson does not disclose or suggest an information for managing the resources of the storage system. Accordingly, Rawson does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Rawson.

3. Remaining References

The remaining references of record in the application are deemed to not be most-closely related to the present invention, and/or were provided as background information, and also do not show or suggest the present invention. However, a discussion of each of these remaining references has been provided to avoid dismissal of the Petition in case the Examiner disagrees with Applicants' determination that these references are not most-closely related to the subject matter of the claims.

The patent to Gentry, US 5568629, shows a method for partitioning disk drives within a physical disk array, and selectively assigning disk drive partitions into a logical disk array. The system is a method for partitioning a disk array into logical storage units distinct from the physical storage units within the array. Individual drives within the array are partitioned into multiple partitions. Partitions from two or more drives are grouped together to form a single logical unit. The logical unit is addressed as, and functions as, an independent disk array. The partitions within the logical unit are addressed and function as disk drives within the logical disk array. Thus, a single set or rank of disk drives may be divided into two or more logical units, each functioning as an independent disk array, and each employing a different RAID level scheme for storing data. (See, e.g., Abstract, figures 1-8, column 3 lines 25-67, column 4 liens 20-67, column 5 lines 1-25.) However, Gentry does not teach the partitioning of a computer into virtual computers, or the use of a dedicated

information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Gentry does not teach the creation of independent virtual storage systems, but merely independent logical disk arrays. Accordingly, Gentry does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Gentry does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Gentry does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Gentry.

The patent to Smith, US 5829053, shows a block storage memory management system and method utilizing independent partition managers and device drivers. In the system, data can be retrieved from an arrangement of virtual storage devices by first identifying a physical or logical storage device and a corresponding first mapping plug-in associated with the identified storage device. The first device driver scans the storage device to determine its partition formats. A first partition manager associated with the storage device contains a first partition

map describing the first storage device, and a first partition code to read the first partition map data and generate a second virtual storage device having a second partitioning format and second device driver from the first partition map. The device driver and partition manager for each storage device are separated to allow the nesting of partition formats and avoid the replication of partitioning codes. (See, e.g., Abstract, figures 1-6, column 2 lines 60-67, column 3 lines 1-15, column 4-5.) Accordingly, while Smith has a partition manager, Smith does not teach the partitioning of a computer into virtual computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Smith does not teach the creation of independent virtual storage systems, but merely the portioning of logical storage disks or devices. Accordingly, Smith does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Smith does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Smith does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Smith.

The published US patent application to Lubbers, US 20030084241, shows a system and method for atomizing storage through a virtualized storage system. Physical storage is carved into units called physical segments. Logical storage is implemented in atomic logical units called RStores comprising a range of virtual address space that, when allocated, is bound to a particular group of physical segments (PSEGs). RStores preferably implement a selected data protection. A pool of physical storage devices is carved into redundant storage sets. A plurality of RStores make up a logical disk that is presented to a user. Storage access requests expressed in terms of logical disk addresses are mapped to PSEGs containing data represented by the logical addresses through a split-directory representation of the logical unit. (See, e.g., Abstract, figures 1-10, paragraphs 19, 30-38, 47-51.) Thus, unlike the present invention, Lubbers fails to teach the partitioning of a computer into virtual computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Lubbers does not teach the creation of independent virtual storage systems, but merely the partitioning of logical storage disks. Accordingly, Lubbers does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Lubbers does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual

storage systems, as set forth in claim 27. Additionally, Lubbers does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Lubbers.

The published US patent application to Mahalingam, US 20030115434, shows a system for migration of logical volumes in a distributed file system having multiple partition servers. Each partition server owns one or more volumes, and each volume includes a subset of logically related objects of the file system. A storage manager 106 maintains logical volume identifiers (LV-IDs) and corresponding partition server identifiers in an LV-ID map 124. Alternatively, each partition server may maintain an ownership table having the LV-IDs of all the volumes that the partition server owns. (See, e.g., Abstract and paragraphs 11, 23-25.) Thus, Mahalingam provides no teaching related to logically-partitioned virtual computers, but, rather, Mahalingam is directed to the use of multiple servers, each of which owns one or more logically-partitioned storage volumes. Accordingly, Mahalingam is of only general interest to the present invention, and does not provide any teaching relevant to managing relations between a virtual computer and a virtual storage, or the creation of independent virtual storage systems. Consequently, Mahalingam does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in

claims 14, 31, and 41. Further, Mahalingam does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Mahalingam does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Mahalingam.

The published US patent application to George, US 20030182501, shows a method and system for dividing a plurality of existing volumes of storage into a plurality of virtual logical units of storage. The method and system increases the number of logical units (LUNs) of storage within a storage device. The virtual LUNs are created by partitioning the existing volumes into a plurality of slices. Each of the plurality of slices is then mapped to the plurality of virtual LUNs. Each of the plurality of virtual LUNs is masked to each of the plurality of host applications to provide access control. Moreover, a plurality of host applications are transparently interfaced with the existing volumes via a virtualization software layer that interfaces with and preserves the originally configured internal intelligence (i.e., internal operating code) that accesses the plurality of volumes. (See, e.g., Abstract, figures 1-7, paragraphs 11-13, 25-34.) Thus, while George teaches an internal intelligence for managing logical partitioning, George does not teach the partitioning of a computer into virtual

computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, George does not teach the creation of independent virtual storage systems, but merely the creation of logical storage units. Accordingly, George does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, George does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, George does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over George.

The published US patent application to Ng, US 20040049564, shows a method and apparatus for collecting information from ports on a storage network and performing flow control. Ng teaches a virtual storage exchange (VSX) that is embedded into the fabric of a storage area network. Communications between any server and any storage device passes through the VSX devices for monitoring and flow-control. (See, e.g., Abstract and paragraphs 23-30, and 35-39.) Thus, Ng also contains no teaching relevant to the use of logically partitioned virtual computers, or

means for managing relations between a virtual computer and a virtual storage, or the creation of independent virtual storage systems. Accordingly, Ng does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Ng does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Ng does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Ng.

The published US patent application to Chen, US 20050010722, shows a multi-volume disk array management method and system. The system provides a multi-volume disk array management method and system that allows a low-end RAID unit to be organized into two or more logical volumes which can be set to different RAID levels for the purpose of allowing data of different levels of importance to be stored in different locations so that the low-end RAID unit can be nonetheless versatile to use in data storage. The system includes logically dividing the storage space of each of the disks in the multi-disk storage unit into a number of partitions; organizing at least two selected subgroups of partitions in the disks of the multi-disk

storage unit into at least two logical volumes; and setting the storage property of each of the logical volumes in the multi-disk storage unit to a user-specified level of fault tolerance. (See, e.g., Abstract, figures 1-2, paragraphs 9-11, 16-17 and 29.) Accordingly, Chen does not teach the partitioning of a computer into virtual computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Chen does not teach the creation of independent virtual storage systems, but merely the creation of logical volumes. Accordingly, Chen does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Chen does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Chen does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Chen.

The published US patent application to Zohar, US 20050015546, shows a data storage system. The system includes: one or more mass-storage devices, coupled to store partitions of data at respective first ranges of logical addresses

(LAs); a plurality of interim devices, configured to operate independently of one another, each interim device being assigned a respective second range of the LAs and coupled to receive the partitions of data from and provide the partitions of data to the one or more mass-storage devices having LAs within the respective second range; and one or more interfaces, which are adapted to receive input/output (I/O) requests from host processors, to identify specified partitions of data in response to the I/O requests, to convert the I/O requests to converted-I/O-requests directed to specified LAs in response to the specified partitions of data, and to direct all the converted-I/O-requests to the interim device to which the specified LAs are assigned. (See, e.g., Abstract, figures 1-15, paragraphs 17-74.) Thus, Zohar does not teach the partitioning of a computer into virtual computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Zohar does not teach the creation of independent virtual storage systems. Accordingly, Zohar does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Zohar does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Zohar does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an

independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Zohar.

The published US patent application to Uchishiba, US 20020016812, shows a logically-partitioned computer system that includes a physical computer that is provided with a resource-managing unit for managing a resource being assigned to the physical computer, and an assigning/collecting unit provided in the physical computer for effecting the assignment or collection of a resource with respect to each of the logical partitions of the computer. A resource management table is provided for managing resources. Additionally, when there is a capacity shortage in a virtual storage device of the main storage device, a guest resource monitoring unit reports resource shortages to a guest resource adding/separating unit. (See, e.g., paragraphs 14-18, 35-38, 46-49, and 52-60.) Thus, while Uchishiba addresses managing resources in a logically partitioned computer, Uchishiba does not address partitioning of a storage system into independent virtual storage systems, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Accordingly, Uchishiba does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Uchishiba does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual

storage systems, as set forth in claim 27. Additionally, Uchishiba does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Uchishiba.

The published US patent application to Foster et al., US 20020124040, shows a logical partition computer system in which a plurality of logical partitions run independently of other logical partitions. A console is coupled to the computer for accepting logical partition configuration data input by an operator. Thus, an operator is able to manage the configuration of the system resources allocated to each logical partition. The system includes a set of tables for storing logical partition data. (See, e.g., paragraphs 5-6 and 9-16.) Thus, Foster does not address partitioning of a storage system into independent virtual storage systems, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Accordingly, Foster does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Foster does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Foster does not teach a storage system that

includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Foster.

The Japanese publication, JP 2003157177, to Kawamoto, (corresponding to US 20030097393) provides general background information on logical partitioning of a computer system to produce a plurality of logical partitions that run an operating system in each logical partition. A hypervisor allocates computer resources to the logical partitions relative to loads and settings. Thus, Kawamoto does not teach the partitioning of a computer into virtual computers, or the use of a dedicated information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system. Further, Kawamoto does not teach the creation of independent virtual storage systems. Accordingly, Kawamoto does not teach the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41. Further, Kawamoto does not provide an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27. Additionally, Kawamoto does not teach a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the

resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over Kawamoto.

CONCLUSION

From the above discussion, it is apparent that none of the art of record shows or suggests the present invention, including: the use of an information for managing a relation between a virtual computer realized on a computer and a virtual storage system realized on a storage system, as recited in claims 14, 31, and 41; or providing an information related between a first virtual computer in a plurality of virtual computers and a first virtual storage system in a plurality of virtual storage systems, as set forth in claim 27; or a storage system that includes a resource, an information for managing the resource, and a function to partition the resource logically and to make each partition of the resource run as an independent virtual storage system, as set forth in claims 14 and 36. Accordingly, claims 14, 27, 31, 36, and 41 are patentable over the cited references.

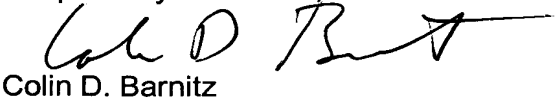
The Applicants submit that the foregoing discussion demonstrates the patentability of the independent claims over the closest-known prior art, taken either singly, or in combination. The remaining claims depend from the independent claims, claim additional features of the invention, and are patentable at least because they depend from allowable base claims. Accordingly, the requirements of 37 CFR §1.102(d) having been satisfied, the Applicants request that this Petition to Make Special be granted and that the application be examined according to prescribed procedures set forth in MPEP §708.02 (VIII).

The Applicants prepared this Petition in order to satisfy the requirements of 37 C.F.R. §1.102(d) and MPEP §708.02 (VIII). The pre-examination search required by

these sections was "directed to the invention as claimed in the application for which special status is requested." MPEP §708.02 (VIII). The search performed in support of this Petition is believed to be in full compliance with the requirements of MPEP §708.02 (VIII); however, Applicants make no representation that the search covered every conceivable search area that might contain relevant prior art. It is always possible that prior art of greater relevance to the claims may exist. The Applicants urge the Examiner to conduct his or her own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited above and any other prior art that may be located by the Examiner's independent search.

Further, while the Applicants have identified and discussed certain portions of each cited reference in order to satisfy the requirement for a "detailed discussion of the references, which discussion points out, with the particularly required by 37 C.F.R. §1.111(b) and (c), how the claimed subject matter is patentable over the references" (MPEP §708.02(VIII)), the Examiner should not limit review of these documents to the identified portions, but rather is urged to review and consider the entirety of each reference.

Respectfully submitted,



Colin D. Barnitz
Registration No. 35,061
Attorney for Applicants

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 Diagonal Rd., Suite 370
Alexandria, Virginia 22314
(703) 684-1120
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